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ABSTRACT

In order to overcome the problems confronting Guyana's educational system, this paper presents a plan for the utilization of modern technology--radio, television, and other audiovisual media--in all aspects of the system. Methods are outlined for the application of this technology to teaching methods and materials, teacher preparation, curriculum reform, independent learning, and research and evaluation. (WP)

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"Plan for Educational Technologies Program in the Formal Education System of Guyana"

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ABSTRACT

Because of the difficulties which Guyana's education system faces - lack of financial resources, shortage of skilled manpower, and technical facilities, the author proposes that a system of educational technology might assist in the alleviation of them.

The plan for the implementation of such a program for the formal education system of the country was drawn from a review of the literature relevant to Guyana as well as that from the general area of developing countries. Persons knowledgeable in the field of education in Guyana also contributed and input from experts solicited. What emerges, then, is a plan which seeks to incorporate all the ingredients for the introduction of educational technology in Guyana and to be applied to the local setting.

Development Priorities

National Development Goals

Guyana identified three national Development goals: self-sufficiency and self-reliance; to stimulate productivity in those areas where it lags and promote it where it does not exist; and to develop the country through the formation of collectives (Burnham, 1970). These national development goals are incomplete without educational goals and Baird (1972) stressed the "essential linkage between the education and economic and social development, between the growth and welfare of the individual and the growth and welfare of the national society" (p. 2).

Educational goals underline the need for close relations between national goals and education planning. Baird (1972) declared that Guyana's education goals are designed to:

1. effect inter-relation between the various levels of education,
2. promote cooperation between ministries, so that Ministries of Education, Labor and Economic Development work in close relationship, developing and utilizing technical skills to meet national demands.
3. raise the technical status of the secondary department of primary schools and produce a group of students capable of gaining admission directly to the Technical Institute without prerequisite training.
4. set up a National Education Council to co-ordinate and supervise Technical Education.
5. establish approved vocational centers for the secondary departments of All-age schools. (pp. 19-20)

Goals are predicated on needs and these also have been identified by Baird (1972). But many developing countries find themselves in desperate need of the basic requirements for development and Guyana is not alone in this area. Indeed, educational needs include:

1. Trained personnel, including teachers at all levels.
2. Mathematical skills for technical careers.
3. Vocational and occupational skills for persons in adult education.
4. Management skills for positions in industry.

What alternative means are there for meeting these educational needs?

Alternative Means to Educational Development

Many solutions exist for the educational planner/decision-maker. Beeby (1967) points out that these are, for the most part, approved, tried and tested, and offer convenient ladders for educational development: better trained teachers, longer school hours, more efficient utilization of space and equipment, reorganization of the lines of authority, and so on.

The resources used to teach these methods have been traditional: teachers, textbooks and other printed material. However, many have come to realize (Schramm et al., 1967; Tickton, 1972; Dieuzeide, 1971; Nuss and McAnany, 1971) that the tasks would be more efficiently and more quickly accomplished by appropriate uses of educational technology. More specifically, personnel (including teachers) can be trained at all levels; technical skills can be imparted; and vocational and occupational skills can be communicated if technology is applied in a systematic way.

The choice of the means to implement each strategy depends on a web of complex factors: (a) the needs of the learner, (b) the nature of the task, (c) the objectives, (d) costs, (e) availability of the media, (f) availability of media, and (g) political considerations. Even so, Schramm (1972) suggests that "for a given situation, one medium or combination of media is likely to be more desirable than another, for one reason or another" (p. 12). For example, communications media have opened up an array of possibilities for seeking and fulfilling objectives; and in relation to Guyana's educational needs, there is evidence of their successful utilization elsewhere (Schramm, 1972).

Each alternative educational strategy is actually a composite of numerous variables and each cluster of variables can be grouped into a system. For example, a typical system would consider:

-- technical reliability

-- the ability to reach a target population

-- personnel required to work it

-- capacity for feedback within the system

-- organization and management variables

-- cultural variables

-- relation to other components such as teachers, students, materials, etc.

-- what the research says.

But let us not automatically accept the idea of a communications system for Guyana without considering alternative strategies for bringing about a change.

Alternative 1: Conventional Improvements

The first alternative examines the expanding school population and the need for more teachers, schools, administrators, equipment, and facilities.

These conventional improvements do not now fit the demands of a society that is in social transformation. Where a radical change in the education system is called for, are textbooks and printed material alone the best means of achieving this? Manuwuike (1972) suggests that the old methods alone are inappropriate in today's world and recommends a fusion with the new technology. Dieuzeide (1972) advocates a similar point of view. UNESCO (1965,1967) points to the importance of media, in conjunction with other alternatives, as important ingredients in educational planning. Also, educational publishers have advocated that instruction is more effective when materials are an integral part of the entire instructional system (Lewis, 1963):

> The emphasis is not on enrichment or supplementary materials, but rather on the consolidation of all materials and techniques into a design that ensures the best use of the teacher and the media in instruction and meets the individual pupil's way of learning.
> (p. 99)

Alternative 2: Educational Technology Methods

Some of the questions posed by educational technology are appropriate for Guyana: to what degree can a country, school system, or society utilize sophisticated modern techniques to obtain the best results from the workings of its educational systems? What kinds of resources are available to achieve better and more economical teaching of more people? What does the research say about educational technology projects in developing nations elsewhere and what conditions are necessary for their successful implementation.

There is much evidence of the application of television (Schramm, 1967, 1972). Major projects involving television in education include American Samoa, El Salvador and the Ivory Coast. Research into television and education reveals that television can be effective as a learning tool when it is carefully planned (Chu and Schramm, 1968). As yet, Guyana has no national television, but closed circuit application is a possibility.

Radio is an attractive component, for radio has been an integral part of Guyana's cultural milieu for a generation. Radio has certain obvious advantages: cheapness, flexibility, and the possibility of penetrating the vast hinterland of Guyana with relative ease. Radio has been extensively used since 1954 by the Ministry of Education through its schools broadcast division. According to the Ministry of Education and Social Development (1974), the curriculum provides for primary and secondary schools and also for adult education. Language courses, social studies, literature, and current affairs programs are taught at primary and secondary school levels. Skills in business, management and social studies are prepared for adult education groups. The schools broadcast division is headed by an organizer and an administratrative staff, including three program producers. Since radio is the dominant medium of communication, the work of this division is likely to expand.

Other media should be considered. Jones (1972) considers

> necessary teaching materials of the present and future are tapes, film strips, slides and pictures which are being produced by the Broadcasts to Schools Division and the Audio-visual Division. (p.2)

These little media may be used in varying degrees in a design likely to be supportive of and conducive to learning in the classroom environment.

Alternative 3: Total Commitment to Educational Technology

A total commitment to educational technology envisages its application to all aspects of an education system: teaching methods, teacher preparation, teaching materials, curriculum reform, independent learning, and research and evaluation (Tickton, 1972). The theoretical justification for this comprehensive approach is that experience has shown that "innovations are meaningful and effective only in relation to their effects upon the body as a whole." (Dieuzeide, 1971, p. 32). This view posits, along with others, a reformist as opposed to a stopgap role for educational technology. It sees educational technology as a catalyst for change when comprehensively applied as opposed to a palliative application.

Furthermore, according to AED (1972):

> Educational technology will bring optimal benefits if it is planned as part of a wide reordering of education change in teaching methods, in curriculum, in the teachers role, in standards of achievement. (p. 9)

The application of educational technology requires educational authorities to question many of the assumptions on which conventional education has been based. Questions such as

-- whether there is need for six years schooling to achieve the aims of primary education?

-- why education must be organized on the basis of academic subjects rather than on tasks and problems?

-- why must the textbook be the primary source of information?

-- why must all students go through the education system at the same rate?

-- what learning can be gained from electronic and other media so as to free the teacher to perform other classroom tasks?

In many countries these questions have been and are being asked, but only a few countries "built technology into their educational systems to improve the educational process substantially in a short time" (Tickton, 1972, p. 98).

More specifically, Miller (1973) identified three main priorities for educational technology in developing countries: (1) to improve the learning process, (2) to improve educational efficiency, and (3) to improve access to education. These priorities depend on how a country sees its goals and objectives and what its resources are. It is only then that it can decide which of the technologies can address its particular problem. One significant feature of the total application of educational technology to developing countries has been that it has been learner-oriented and not teacher-oriented. AED (1973) emphasizes that

> to be practical ... there must also be real consideration for other levels -- the class, the school and the school system, the nation, perhaps even the international community. (p. 23)

The Plan

Based on the evidence of successful utilization of educational technology in developing countries, the author believes that the problems of education in Guyana can be greatly alleviated by the introduction of educational technology measures. Planning for educational technology is an exercise in cooperation at the national, county, and school levels, involving media professionals working with administrators, users, and community members. A typical plan comprises seven sections: Purpose, Educational Technology and Educational Goals, Guyana: Goals and Problems, Organization, Personnel,

Educational Technology Program, Priorities and Recommendations. However, we now consider a part of the educational the educational technology program.

Educational Technology Program

1.1 Determination of Needs

Traditionally, teaching has emphasized subject matter and content of the various disciplines, and teachers in training have not been systematically exposed to educational technology.

Fundamentally, the teacher in a formal education system needs:

(a) To know what materials are available.

(b) Information about the quality of the materials, their content, and their value.

(c) Advice on what materials to select to achieve goals.

(d) Knowledge of how to obtain materials.

(e) A logistical system which processes materials, keeps adequate records, and informs him when materials are available.

(f) Technical support for the media he elects to use.

(g) Materials produced locally to specifications.

These services are limited and because of this the following alternative means are recommended to promote utilization of media.

(a) Application of pre-service training in education and educational technology to further competencies.

(b) Provision for in-service training in short courses and seminars.

(c) Provision of consultative services for teachers and education personnel.

1.2 General Recommendations

(a) The Ministry of Education should actively support the efforts of both administrative and professional staff in the exercise of duties.

(b) Research and development should concentrate on a few products at the outset rather than many.

(c) As far as possible, individualized instruction should be used for inservice training.

(d) The community in each school district should be kept abreast of educational developments in order to prepare it to accept change and innovation.

1.3 Personnel Level

(a) Persons should be employed who have diverse talents which can be utilized over more than one area; for example, personnel in research and development who can do evaluation.

(b) Persons who are adaptable to new situations and who have good interpersonal relations should be selected wherever possible for the positions in educational technology.

(c) At the outset of the program, greater time should be concentrated on those teachers who are ready and willing to utilize media. Their example might encourage others to do likewise.

(d) A system of rewards should be instituted such as promotion, salary increases or reduced teaching loads.

1.4 Administrative Level

(a) Both pre-service and in-service training programs should combine adequate support services with simplicity of procedures.

(b) Each county media center should be autonomous and should have fiscal responsibility; that is, it should have a free hand in the administration of finances allotted to it by the government. In this way the media center would provide services to the county free of charge thereby reducing cumbersome interdepartmental administration.

Priorities and Recommendations

1.5 Priorities

(a) The first priority is the training of personnel to carry out some of the innovations in this plan. Aggressive efforts must be made to recruit and train them.

(b) The second priority is curriculum development, continued work on streamlining educational objectives, testing and evaluation

(c) The third priority is the quantification of objectives, for these will necessarily influence the educational materials which will later be developed.

1.6 Recommendations

A number of related developments affecting the plan need to be mentioned The first of these is the formation of multilateral schools which emphasize a diverse secondary school curriculum and provide for technical, commercial, and agricultural studies along with basic studies. This curriculum broadens the options of learners, enabling them to develop technical skills as well as academic skills. The second development parallels the first: the introduction of the community high school whose emphasis is on the training of the less gifted. Given clear objectives, both these innovations are potentially a strong force of change and efficiency in education in Guyana. The third development is the apparent success of the system of self-help schemes initiated by the Ministry of Cooperatives and National Mobilization. Under this scheme, the materials for school building and supervision are provided by the government, but the actual building is done by the school communities.

There three developments affect the educational technology plan in two ways: (1) both multilateral and community high schools stress the learning of additional skills, thus placing additional burden on teachers and creating conditions which can be addressed by educational technology, (2) the system of self help supports local construction of materials which might be needed

as part of the plan. This practice which enhances self-reliance is the basis for the first recommendation.

(a) It is recommended that printed material (including programmed texts) be the vehicle for the introduction of educational te technology in primary schools. Four reasons support this view. First, because printed material is suitable for accomplishing many different learning objectives; second, the development of the national press and the materials production unit have given strong strong incentive for the growth of the publications industry; third, this recommendation can be implemented without extensive change to the existing system; and finally, because of the apparent success of similar schemes in Indonesia and Rhodesia.

(b) That radio transmission together with printed material be the vehicle system for secondary schools. Three reasons support this recommendation. One, the growing demand for secondary school-places cannot be satisfied by traditional means and radio is readily available; two, there has been a tradition of educational broadcasting and the studied expansion of radio to meet the secondary school demand would pose no difficulty; three, radio has been apparently successful in this respect in Mexico and Thailand.

(c) That printed material (including programmed texts) be used as part of the educational system of the Teachers Training College and the University of Guyana. Printed materials already are being used in this capacity at both these institutions and it seems unnecessary to initiate any other system unless there are compelling reasons to do so.

In order for this plan to be implemented effectively, personnel must

perform certain functions. These are logistics, production, design, utilization, evaluation, research and development.

(d) Logistics involves the storage, acquisition, maintenance and management of the media. The following recommendations are made:

(1) National level. That processing, including ordering, receiving cataloguing and distribution be instituted.

(2) County level. That the director of the media center assume the responsibility of this function over the head of the school media program in the interest of efficiency.

That county media centers should be supported by adequate transportation for pickup and delivery of materials from schools to the media center.

(3) School district level. The program should try to ensure prompt access of its resources to teachers and students. Flexible scheduling will support this.

The program should encourage close relations with neighborhood agencies, cooperative groups and the exchange of ideas between schools.

The head of the school media program together with the school principal and teachers should define policies for student participation in the program. He should also encourage learners to seek out skills which aid their ability to select and use media.

Materials and other equipment should be allowed to move freely around the school and if possible in homes as well.

(e) Production is concerned with the development of specialized products which carry out the specifications of the design. The following recommendations are made:

(1) National level. That a consultant be appointed to advice the Ministry of Education on the degree and extent of the expansion necessary for the needs of the expanded secondary school population. Following the consultant's report, the extent to which radio production will be increased will be determined and also work in the materials production unit which is in charge of production of programmed texts, slides, transparencies, and film strips. Personnel and staff requirements, production services, and programming needs will be affected by increased services.

(2) County level. It is recommended that--

(a) The production services provide leadership to and complement production at the school level.

(b) That communication between county media center and schools be encouraged in order to share production and programming ideas.

(c) The production of graphics for use in the curriculum of primary and secondary schools takes place.

(d) A still photography unit to develop and process black and white prints and slides be set up.

(3) School district level. It is recommended that--

(a) Production be less complex and sophisticated than either the national or county levels.

(b) Production should stress only that which is peculiar to a particular school; for example, graphics production should include hand drawings, charts, display kits which are pertinent and relate to groups of students.

(f) *Design* is the application of theory and empirical evidence about learners, media and technique to the requirements of instruction. It is

recommended that--

(a) This function exist only at the county level because it seems easier to plan for differences among schools at this level compared to the national level.

(b) A media specialist initiate and plan design strategy, formulate objectives, establish priorities, select alternatives, evaluate materials. The duties associated with this function should be shared among the staff of the county.

(c) A media specialist in charge of this function be an individual trained in education and educational methods. He should also be flexible in regard to changes in the learning situation since a variety of personnel of diverse background will be involved--teacher, curriculum specialist, learner, administrator, parent.

(g) *Utilization* is the engagement of the media for the purpose of bringing about changes in the learner. It is recommended that--

(a) Seminars and roundtables be instituted to promote interest in and concern for the behavioral processes involved in communication and learning; knowledge of media characteristics and capacities; ability to evaluate and conduct or participate in media utilization; familiarity with appropriate materials and their sources; command of the necessary manipulative skills.

(b) The Ministry of Education determine the technical reliability of the existing radio station, and its ability to reach the target population and the number of additional radio receivers required to launch programs.

(c) Regular checks be instituted to determine both the fidelity of listening and whether lesson plans are being carried out.

(d) Courses be scheduled to engage the attention of learners who are not listening to a program so that no time is wasted.

(e) The design of buildings be such that equipment is protected from dust and dampness by means of proper and adequate storage facilities. This is of particular importance in Guyana where proximity to the sea can cause corrosion. Proper attention should be paid to ventilation.

(f) Sufficient electric power should be provided particularly in rural areas like the Rupununi to cover equipment usage.

(h) *Evaluation* assesses the attainment of objectives and information which can be used for making later decisions about the conduct of operations and the management of media instruction. It is recommended that at the--

(1) National level. The Ministry of Education institute periodic evaluation of the entire program. Personnel responsible for the national program evaluation will be those mentioned in the context of administrative and professional personnel on pages 9-10. The evaluation plan provides for: media evaluation in terms of the total educational technology program; continuing evaluation of the county media program and school media program; special evaluation by outside personnel.

(2) County level. It is recommended that--

(a) The designing and implementation of an evaluation program for schools should rest with the director of each county media center who would co-opt administrators, curriculum specialists, heads of the school media program, and the principal of the

school into the evaluation plan. Input should also be supplied by the users.

(b) At this level course, evaluation should take place. Course evaluation includes teacher evaluation and methods and procedures evaluation; also evaluation of educational materials.

(3) School district level. It is recommended that—

(a) Evaluation be conducted by the head of the school program who carries out the same kinds of evaluation as at the county level: interaction between county and school could help to refine the evaluation instruments.

(b) The concerns of the school evaluation program should be to determine: numbers within schools affected by educational technology; participation level of teachers and learners; school community; the accomplishment of school media program within the total community.

(c) On-going evaluation of student achievement.

(i) *Research and development* involves the testing of theory which contributes to educational technology and the development of validated media products. It is recommended that at the—

(1) National level. A coordinator be appointed to administer and coordinate research interests between the University of Guyana, the Teachers Training College and the counties. In addition to working in harmony with administrators in primary, secondary, and higher levels of education, the coordinator will encourage participation at all levels in research. Much therefore will depend on the quality

of the research and its relevancy to the school system. Long term and expensive projects might have to be shelved in the interest of short-term, more financially manageable ones, even though the former may be more efficacious than the latter.

(2) County level. It is recommended that--

(a) The director of the county media center should draw up research priorities which might assist in the activities of both center and schools. Later he will initiate research projects at the primary and secondary school level.

(b) At the school district level, research interests are the concern of the county media director who receives input from the heads of schools media programs.

This study dealt with a draft of a plan of educational technology in the formal education system of Guyana. It is designed with a view to implementation and not simply as an exercise in drawing board strategy. The author is aware nevertheless of the difficulties which must be faced for it to be implemented.

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